

WHAT IS CLAIMED IS:

1. An X-ray computed tomography apparatus  
comprising:

5 a scan unit configured to scan an imaging target  
region of a subject to be examined with X-rays in  
accordance with a scan condition;

a reconstruction unit configured to reconstruct  
image data on the basis of projection data acquired by  
the scan;

10 a scan condition setting unit configured to set  
the scan condition;

a picture quality index calculating unit  
configured to calculate a value associated with an  
index of picture quality on the basis of the set scan  
15 condition;

a sample image storage unit configured to store  
sample image data corresponding to a reference value  
associated with the index of picture quality;

20 a simulation image generating unit configured to  
generate simulation image data corresponding to the  
calculated value associated with the index of picture  
quality from the sample image data on the basis of the  
calculated value associated with the index of picture  
quality and the reference value associated with the  
25 index of picture quality; and

a display unit configured to display the generated  
simulation image data.

2. An apparatus according to claim 1, wherein  
the storage unit stores data associated with a  
plurality of sample images corresponding to a plurality  
of reference values, and

5       the simulation image generating unit generates the  
simulation image data by weighting and adding data  
associated with the plurality of sample images on the  
basis of the plurality of reference values and  
calculated values associated with the index of picture  
10       quality.

3. An apparatus according to claim 1, wherein  
the storage unit stores data associated with a  
plurality of sample images corresponding to a plurality  
of regions, and

15       the simulation image generating unit generates the  
simulation image data from sample image data  
corresponding to an imaging target region of the  
subject.

4. An apparatus according to claim 1, wherein the  
20       scan condition includes an image slice thickness, a  
tube voltage, a tube current, a reconstruction  
function, and a beam pitch.

5. An apparatus according to claim 4, wherein the  
picture quality index calculating unit calculates a  
25       value associated with the index of picture quality on  
the basis of at least one of the image slice thickness,  
the tube voltage, the tube current, the reconstruction

function and the beam pitch, and a water equivalent thickness associated with an imaging target region of the subject.

5       6. An apparatus according to claim 5, further comprising a water equivalent thickness calculating unit configured to calculate the water equivalent thickness on the basis of a body thickness of an imaging target region of the subject.

10       7. An apparatus according to claim 5, further comprising a water equivalent thickness calculating unit configured to calculate the water equivalent thickness on the basis of scanogram data associated with the subject.

15       8. An apparatus according to claim 1, further comprising a scan condition storage unit configured to store a plurality of scan conditions corresponding to a plurality of values associated with the index of picture quality, and a scan condition specifying unit configured to specify a scan condition corresponding to  
20       a desired value associated with the index of picture quality.

9. An X-ray computed tomography apparatus comprising:

25       a scan unit configured to scan an imaging target region of a subject to be examined with X-rays;

      a reconstruction unit configured to reconstruct image data on the basis of projection data acquired by

the scan;

an input unit configured to input a value or dose associated with an index of picture quality;

5 a simulation image generating unit configured to generate simulation image data corresponding to the input value or dose associated with the index of picture quality; and

a display unit configured to display the generated simulation image data.

10 10. An apparatus according to claim 9, wherein the input unit includes a slider button to input the value or dose associated with the index of picture quality.

15 11. An apparatus according to claim 9, wherein the simulation image generating unit generates the simulation image by weighting and adding a plurality of sample images corresponding to a plurality of reference values associated with the index of picture quality on the basis of the plurality of reference values and a calculated value associated with the index of picture  
20 quality.

12. An apparatus according to claim 9, wherein the simulation image generating unit generates the simulation image from a plurality of sample images corresponding to the input values or does associated  
25 with index of picture quality.

13. An apparatus according to claim 9, further comprising a scan condition recommended value

determining unit configured to determine a recommended value of a scan condition corresponding to the input value or dose associated with the index of picture quality.

- 5           14. A picture quality simulation apparatus comprising:

          a scan condition input unit configured to input a scan condition associated with scanning by an X-ray computed tomography apparatus;

- 10           a picture quality index calculating unit configured to calculate an index of picture quality on the basis of the input scan condition;

- a sample image storage unit configured to store sample image data corresponding to a reference value associated with the index of picture quality;

- 15           a simulation image generating unit configured to generate simulation image data corresponding to the calculated value associated with the index of picture quality from the sample image data on the basis of the calculated value associated with the index of picture quality and a reference value associated with the index of picture quality; and

- 20           a display unit configured to display the generated simulation image data.

- 25           15. A picture quality simulation apparatus comprising:

          an input unit configured to input a value or dose

associated with an index of picture quality of an X-ray  
computed tomography apparatus;

5       a simulation image generating unit configured to  
generate simulation image data corresponding to the  
input value or dose associated with the index of  
picture quality; and

      a display unit configured to display the generated  
simulation image data.

10       16. A computer program product configured to store  
program instructions for execution on a computer system  
enabling the computer system to perform:

      inputting a scan condition associated with an  
X-ray computed tomography apparatus,

15       calculating a value associated with an index of  
picture quality on the basis of the input scan  
condition;

      storing sample image data corresponding to a  
reference value associated with the index of picture  
quality,

20       generating simulation image data corresponding to  
the calculated value associated with the index of  
picture quality from the sample image data on the basis  
of the calculated value associated with the index of  
picture quality and a reference value associated with  
25       the index of picture quality, and

      displaying the generated simulation image data.

      17. A computer program product configured to store

program instructions for execution on a computer system enabling the computer system to perform:

inputting a value or dose associated with an index of picture quality of an X-ray computed tomography

5 apparatus,

generating simulation image data corresponding to the input value or dose associated with index of picture quality, and

displaying the generated simulation image data.